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Health Literacy and Type 2 Diabetes in Barbados

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Abstract

In this qualitative instrumental single case study, I explored how patients living with Type 2 diabetes (T2D) in Barbados manage the disease and what role health literacy might play. Purposeful sampling aided in selecting the sample for the study. The sample was 23 participants who were 40 years and older, diagnosed with T2D, living in Barbados, and attending the Endocrine Center for treatment. Participants responded to 13 open ended questions used to answer the research questions. Information was coded using NVivo 10 software and the software provided the themes based on the participants' responses to the interview questions. The themes provided were understanding T2D, lifestyle changes made post diagnosis, self-care after T2D, and support systems. The interpretation of the findings was that patients in Barbados had a moderate understanding on how to manage T2D and managed the disease with moderate effectiveness. The findings also revealed that health literacy might have a meaningful impact on how to manage T2D, but other factors might be involved. Recommended strategies are to improve communication between patient and providers and to provide initiatives to improve patients' self-efficacy. The findings might provide health care leaders and policy makers with insight on how patients living in Barbados with T2D manage the disease and the role that health literacy might play.

Keywords

Type 2 Diabetes, Health Literacy, Barbados, Diabetes in Barbados, Complications of Type 2 Diabetes in Barbados, Case Study

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Health Literacy and Type 2 Diabetes in Barbados

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In this qualitative instrumental single case study, I explored how patients living with Type 2 diabetes (T2D) in Barbados manage the disease and what role health literacy might play. Purposeful sampling aided in selecting the sample for the study. The sample was 23 participants who were 40 years and older, diagnosed with T2D, living in Barbados, and attending the Endocrine Center for treatment. Participants responded to 13 open ended questions used to answer the research questions. Information was coded using NVivo 10 software and the software provided the themes based on the participants' responses to the interview questions. The themes provided were understanding T2D, lifestyle changes made post diagnosis, self-care after T2D, and support systems. The interpretation of the findings was that patients in Barbados had a moderate understanding on how to manage T2D and managed the disease with moderate effectiveness. The findings also revealed that health literacy might have a meaningful impact on how to manage T2D, but other factors might be involved. Recommended strategies are to improve communication between patient and providers and to provide initiatives to improve patients' self-efficacy. The findings might provide health care leaders and policy makers with insight on how patients living in Barbados with T2D manage the disease and the role that health literacy might play. Keywords: Type 2 Diabetes, Health Literacy, Barbados, Diabetes in Barbados, Complications of Type 2 Diabetes in Barbados, Case Study

Type 2 diabetes (T2D) is a severe crisis in the Caribbean, especially in Barbados (Ferguson, Tulloch-Reid, & Wilks, 2010; Taylor et al., 2014). In 2017, there were 35,600 cases of diabetes in Barbados (International Diabetes Federation, 2017). Taylor et al. (2014) reported that Barbados had the highest amputation rates related to diabetes listed in the English medical literature. Lower extremity amputations can threaten the health and quality of lives of patients living with amputations (Bonner, Harvey, & Sherman, 2017). With Barbados facing a health crisis with diabetes, there may be an existing problem with health literacy and diabetes management in the population. There is no literature to support that there is a problem with health literacy and diabetes in Barbados; however, with the outcomes for diabetes in Barbados less than optimal (Adams & Carter, 2011), there could be a problem with health literacy as it relates to diabetes self-management.

The problem is that Barbados, like other Caribbean countries, is facing a diabetes epidemic, with 17.5% of the population over age 40 having T2D (Taylor et al., 2014). Research by Assari (2014) suggested that, in Barbados, older patients have poorer subjective health with respect to diabetes than younger patients do. Taylor et al. (2014) suggested that people living with T2D in Barbados need better care, as evidenced by the high prevalence of preventable diabetes problems and suggested that patient education is imperative. The significance of this problem is demonstrated by the increasing number of patients diagnosed with T2D, less than optimal outcomes including high amputation rates, and high inpatients rates for this population (Adams & Carter, 2011; Diabetes Association of Barbados, 2010; Gill, 2009; International Diabetes Federation, 2017; Taylor et al., 2014). The purpose of this study was to examine how patients living with diabetes in Barbados manage the disease and what role health literacy might play in improving self-management.

Type 2 Diabetes

Type 2 diabetes (T2D) is a global health care crisis that threatens the economies of all nations (Hu, 2011). Akman and Olgun (2016) defined T2D as a “chronic metabolic disease that requires continuous medical care” (p. 29). Patients living with type 2 diabetes suffer from insulin deficiency and their bodies cannot benefit sufficiently from nutrients like carbohydrates, fats or proteins (Gulsen & Olgun, 2016). Health care professionals and patients must be able to alleviate the risks of adverse complications caused by diabetes (Akman & Olgun, 2016).

Barbados

Barbados is the most easterly of the Caribbean islands (National Geographic, 2013). Barbados is 166 square miles, the 15th most densely populated country in the world, and a popular tourist destination (Phillips et al., 2012). The island has a population of more than 280,000 people and boasts a literacy (the ability to read and write) rate of 99.7% (CIA, 2014). The population in Barbados consists primarily of 92% African Americans and 2.7% Caucasians (CIA, 2014).

Health Care in Barbados

Barbados modeled its health care system on the United Kingdom’s health care system (Phillips et al., 2012), making health care accessible to all residents. The Barbados government owns the Queen Elizabeth hospital, the main hospital on the island (Phillips et al., 2012) which have 600 beds and provides care for pediatrics, obstetrics, plastic surgery, radiology, and diseases (Hennis, 2011). There are eight government polyclinics, five geriatrics hospitals, and a network of childcare facilities that provide free health care to the public (Cohall, Scantlebury-Manning, Cadogan-McLean, Lallement, & Willis-O’Connor, 2012; Hennis, 2011). The Barbados government provides free drugs to patients, aged 16 to 65 years, to treat diabetes, hypertension, cancer, asthma, and epilepsy (Cohall et al., 2012).

Prevalence of T2D in Barbados

Diabetes is a major problem in the Caribbean Region, especially in Barbados. Type 2 diabetes contributed to the majority of female hospitalizations in Barbados (Ferguson et al., 2010). In a study conducted by Taylor et al., in 2014, T2D was the diagnosis for 33.6% of the 107 patients admitted to the hospital. According to Taylor et al., the prevalence of diabetes in Barbados is 42.5%, making it the highest in the English medical literature. Adams & Carter (2011) reported that there are numerous deficiencies in the quality of diabetes care and stated that a lack of self-efficacy may be responsible. In 2005, there were 110 amputations and that number increased to 200 amputations in 2017 (Barbados Advocate, 2017; Hennis, 2005).

Health Literacy

Health Literacy is a critical skill that allows the patient to be active in their health care (Jacobs, Ownby, Acevedo, & Waldrop-Valvede, 2017). The National Library of Medicine (2014) defined health literacy as understanding health information and using the health information to make appropriate decisions for one’s health. Rudd (2013) defined health literacy as how individuals gather, measure, and grasp basic health information and services needed to make appropriate health decisions. Researchers in Canada defined health literacy as the

patient's ability understand, evaluate, and disseminate information to enlist the demands of various health situations to promote health (Mancuso, 2010). The determinants of health literacy are "reading and numeracy skills, comprehension, the capacity to use information in health-care decision-making, and successful functioning in the role of the health-care consumer" (Kilonzo, Hughes, & O'Connell, 2011, p. 30). Health literacy will empower individuals to make appropriate health-related decisions (Kilonzo et al., 2011).

When individuals are health literate, they will have the skills to ask necessary questions when they need clarification (Kilonzo et al., 2011). A health literate individual understands when health care providers communicate with him or her about health conditions and treatment options. Mancuso (2010) posited that the individual who is health literate would also be able to apply basic reading, writing, and numeracy skills to activities relating to health.

Health literacy is a broad concept that includes an individual's assessment, in addition to a specific skill set that involves using a variety of methods to communicate and interpret health information that have unique demands (Cavanaugh, 2011). Health literacy also includes having various methods of communicating and interpreting health information in addition to individual levels of intelligence (Cavanaugh, 2011). The increased prevalence, mortality and morbidity of T2D in Barbados (Barbados Diabetes Foundation, 2013; Diabetes Association of Barbados, 2010; Ferguson et al., 2010; Gill, 2009) provides evidence that it is necessary to manage T2D. Health literacy, self-efficacy, and self-management are the tools that could accomplish management of the disease (McCleary-Jones, 2011).

As the primary researcher of this study, I have been working in health care for several years and have seen the complications of living with Type 2 diabetes (T2D) both personally and professionally. I am interested in seeing how health literacy can assist people with managing T2D. I was born in Barbados and know first-hand how T2D can complicate the lives of those living with T2D. My intention is to see the people living with T2D especially those in Barbados.

Method

A qualitative approach using the case study method was chosen for this study because qualitative research is the approach used to investigate people in their natural environment when sharing their lived experiences (Christensen, Johnson, & Turner, 2011). This approach provided the ability to use semi-structured open-ended questions to examine situations in-depth and explore complex questions (Coyle & Tickoo, 2007). A qualitative approach was used to explore how patients living with T2D in Barbados managed the disease and what role health literacy may play. The qualitative approach allowed the researcher to gain insight into how diabetic patients in Barbados manage T2D and what role health literacy might play. Qualitative studies mostly derive their results from fieldwork, where a researcher spends time directly with participants. The qualitative approach allowed the collection of first-hand data about the participants' lived experiences and provided insight about how patients residing in Barbados understand and manage T2D (Patton, 2002).

Design

A case study was the appropriate qualitative method because the case study generates an in-depth understanding of health literacy (Simons, 1996), and its influence on how patients living with T2D in Barbados manage the disease. A case study suits the needs of this study, because the case study is a research strategy used to examine current experiences in real-life situations (Yin, 2014). A case study provides an in-depth exploration of an event or a phenomenon in its natural environment (Yin, 1981) when the boundaries between the event or

phenomenon and context is not evident (Yin, 2014). The instrumental case study is used to provide an insight into an issue and helps to researcher to pursue the external interest of the case and plays a supportive role in the researcher's understanding (Baxter & Jack, 2008). A single case study was used because the single case study represented a significant contribution to knowledge and has the potential to connect to many people beyond the participants in the study (Yin, 2014).

Population

This study was approved by the Institutional Review Boards for the University of Phoenix and the University of the West Indies Cave Hill Campus in Barbados. The population for the study were 23 patients who reside in Barbados, are diagnosed with T2D, are 40 years or older, and attend the Endocrine Center for T2D care. The participants consisted of patients who have their T2D under control and those who do not. In addition, some of the participants were health literate and some were not. The treating physician at the Endocrine Center provided information about which patients' diabetes were under control based on their hemoglobin A1C levels. The participants signed a consent to 1) participate in the study and 2) authorize the treating physician to disclose their hemoglobin A1C levels to the researcher.

Informed Consent

First, the participants received information about the study with complete disclosure of risks and benefits. Also included was the purpose of the study, location of the study, the length of the study, when the participants will be expected to participate, and what steps will be taken to keep the information from the study confidential (Cone & Foster, 2006). The researcher provided the participants with the informed consent form and discussed an explanation of the meaning of the study and the consequences of deciding to participate in the study.

Pilot Study

A pilot study ensured that the interview questions were unbiased and likely to provide the information needed for the study (Loscalzo, 2009). The participants in the pilot study had the same characteristics as the participants in the study and responded to the same interview questions. Recruiting participants for the pilot study took place at the same time as the participants for the study, and all participants received the same information. The participants in the pilot study took the Brief Health Literacy Screen (BHLS) to determine their health literacy levels followed by the 13-question interview for the study. The BHLS was designed by Dr. Lisa Chew who gave permission to use it. Three participants participated in the pilot study and provided clear and concise feedback but did not recommend any changes to the questions.

The first three participants who gave informed consent to participate in the study participated only in a pilot study of the interview protocol, which included the interview questions and BHLS questions, and tested data collection methods.

The focus in choosing the sample is to choose participants rich with information (Creswell, 2013). Twenty-three patients were chosen for this study (three for the pilot study and 20 for the study). All study participants were 40 years of age or older and were recruited from the Endocrine Center in Barbados by the researcher asking the patients at the clinic to participate. The rationale for choosing this clinic was because the clinic specializes in the care and treatment of T2D. The participants were chosen based on age, diagnosis of T2D, attendance at the Endocrine center for care, and willingness to participate in the study. The treating

physician at the Endocrine Center provided information about which patients' diabetes were under control based on their hemoglobin A1C levels. The participants signed a consent to (1) participate in the study and (2) authorize the treating physician to disclose their hemoglobin A1C levels to the researcher.

Confidentiality

I made every effort to protect the privacy and confidentiality of the participants. To maintain confidentiality of the participants, each participant received a numeric code (P 001 in consecutive order). Hard copies of collected data were in a locked box for the duration of the study. The locked box was stored in a locked drawer in a storage room at the Endocrine Center. Electronic data was stored in a locked file located on a flash drive in a locked room at the Endocrine Center [data collection site]. The treating physician was the only other person with access to the room, and I was the only person with access to open the box containing the electronic data. I was the only person with access to the key to the locked file and the only one handling and storing the collected data. Minimizing the number of people handling the data helped maintain confidentiality. The data was destroyed 3 years after collection by shredding all hard copies and permanently deleting all electronic data.

Dependability

Dependability includes knowledge about the source of the data in a given study, data collection, how the researcher used the data, and the stability of the data (Houghton et al., 2013). To determine dependability, I provided an audit trail that linked data collection and used NVivo 10 software.

Transferability

Houghton et al. (2013) defined transferability as transferring the results of a study to another setting or for use with a different population while maintaining the meaning from the completed study. Krefting (1991) argued that transferability is the responsibility of the person who wants to transfer the information and not the responsibility of the researcher of the original study. Krefting explained that as long as the researcher provides sufficient descriptive data for comparison, transferability meets the standard. I provided a detailed description of the data, ensuring transferability (Thomas & Magilvy, 2011).

Confirmability

Shank (2006) posited that confirmability addresses the methodology used in the study and corresponds to the data and data analysis. Shank explained that the result of confirmability is a map to allow creation of a similar study. I established credibility, transferability, and dependability for the study by ensuring that the methodology corresponds to the data and data analysis.

Data Collection

Data collection involved two phases. The first phase was preparation and data collection while the second phase was organizing and analyzing the data. During the first phase, the treating physician at the Endocrine Center in Barbados identified potential subjects. The treating physician at the Endocrine Center provided the potential participants with a letter

asking them to participate in the study. I met with the participants and gain their approval to partake in the study.

I used semi-structured open-ended questions to gather information for this study. The interview began after the participants took the brief health literacy test. Each interview began with an explanation of the study, purpose, procedures, participants' rights, and a review and signature of the informed consent form. As part of the interview process, participants responded to 13 semi-structured open-ended questions. I developed the questions and designed them so I could find out about the patients' understanding of T2D and how to manage it effectively. The questions inquired about diet, exercise, assistance managing T2D, and relationship with the treating physician. I read the questions for the health literacy screen and the interview questions to the participants during the pilot study and interview process.

An interview protocol served as a guide for the study. Jacob and Ferguson (2012) defined an interview protocol as "a procedural for directing the new qualitative researcher through the interview process" (p. 2). Jacob and Ferguson further explained that the interview protocol includes a script of what the researcher will say before and after the interview to remind the researcher of the information to be collected. In the study, an interview protocol with semi-structured open-ended, in-depth questions that aligned with the research questions guided the interviews (Jacob & Ferguson, 2012).

From May 23rd through 6th 2015 two sets of semi-structured open-ended interviews were conducted; one for the pilot study and one for the case study. Each participant was interviewed separately in an office behind closed doors. Each participant took the BHLS test, and then answered the interview questions. The study questions and the BHLS questions were asked one by one and the participants responded to each question.

Face-to-face interviews using semi-structured open-ended questions were used to gather information. The interview questions were designed to allow the researcher to explore the effects that health literacy might have on how T2D patients manage the disease. Interviews were conducted because interviews are important in the research process (Yin, 2014). Persaud (2010) described interviews as "a purposeful conversation between two people (the interviewer and the interviewee) to collect data on a particular issue" (p. 633). Interviews and information from the participants' Hemoglobin A1C levels from 6 months prior to the start of the study provided some of the data needed for the study. Respect for the participants' right to privacy was enforced (Leedy & Ormrod, 2013). Information from the participants responses and their Hemoglobin A1C levels were the data used in this study.

Data Analysis

NVivo software aided in coding and categorizing the data collected. The researcher used the six steps identified by Creswell (2013) to prepare and organize the data. The six steps identified are (a) prepare and organize the data for analysis; (b) examine the data; (c) create and describe themes from the data; (d) produce the findings; (e) present and report the findings; and (f) validate the accuracy and credibility of the findings. The goals of the 13 semi-structured open-ended, interview questions provided the participants with the opportunity to reflect on how they manage type 2 diabetes. The three health literacy questions tested the participant's health literacy level. The health literacy questions were presented prior to the interview. A search for frequent patterns and themes aided in analyzing the data. Textual descriptions helped to develop patterns and themes that emerged from analyzing the participants' responses. The purpose for the use of NVivo software to code and categorize the data allowed for management and understanding of the information and to assist in establishing rigor in the study. The results will be organized based on the research questions and will represent responses from all participants.

Results

The results of the study demonstrate that health literacy is a very important factor in managing T2D, but it is not the only factor. Some factors could be provider and patient communication and self-efficacy. Health literacy is important in managing T2D and understanding information relating to diabetes (Kirchbaum, Aarestad, & Buethe, 2003; Sherifali, Jones, & Mullan, 2013; Sousa, Hartman, Miller, & Carroll, 2009), so patients who are not health literate could face problems managing the disease.

Theme 1: Understanding T2D

The first guiding question queried about how patients in Barbados living with T2D are managing the disease. Diabetes self-management is one of the most challenging regimens of all chronic diseases (Yamashita & Kart, 2011). Self-managing diabetes requires that patients collect, process, and understand information specific to diabetes (Yamashita & Kart, 2011). These skills will allow patients to follow treatment solutions that include diet, exercise, nutrition, weight management, and compliance with medications (Yamashita & Kart, 2011). The participants shared their thoughts about what they thought about when they were diagnosed with diabetes while others did not have a clear definition of what they thought. Responses were “sugar” or “high blood sugar, health challenges, that diabetes would kill, hereditary, and eating too many sweets.” P017 stated “my father also had diabetes” and P012 stated “my mother and hereditary.”

P003 stated “I don’t think about it,” and P020 said “loss of limb and eyesight.” P004 stated “the pancreas not producing enough insulin.” When the participants were asked about how they thought they managed the disease, responses included “fair,” “good,” “not very well,” and “very well.” P002 stated “very controlled,” and P001 stated “I don’t know.”

When questioned about what they found most challenging about diabetes, all the participants responded with some denying having any challenges. Some participants reported that “diet” was their challenge, while others listed “controlling blood sugars, checking blood sugars, and taking insulin and checking blood sugar.” Other responses were trying not to “eat sweets,” “making changes relating to T2D and staying away from sugary fruits,” and “staying focused on managing the disease.”

After discussing the challenges, the participants were asked what they did well to manage their diabetes and all participants provided their self-management routine. Among the responses were “diet,” “diet and exercise,” “testing blood sugar and adjusting medications to suit blood sugar levels,” “drinking water,” “exercise and diet,” “medication,” and “exercise.” The participants were queried whether their increased level of understanding T2D had a positive or negative influence on being more involved in self-managing T2D and they all thought that it was “positive.” When asked if they understood how to manage T2D properly, most participants said that they understood.

When asked whether they had problems understanding information that the treating physician provided, most participants said that “they did not have any problems understanding information from their healthcare provider(s),” while others said that “they did not understand the information.” When probed about what was difficult to understand, P 009 said “how to take the medications,” P 016 stated “I do not understand how T2D infiltrates the system and stays around,” and P 014 stated, “I don’t understand how to stick to the diet.” When probed further about what would help them to understand better, P 009 and P 014 stated, “I don’t know,” P 016 said, “more reading and talking with other people who are also diagnosed with T2D.” When asked what they do when they do not understand the information, P 009 said “I plan to ask the doctor,” and P 014 and P 016 stated “I could ask the doctor.”

According to the University of California San Francisco (n.d.), understanding diabetes is the first step to managing it, and patients need to know what diabetes is and how to maintain and treat your diabetes (University of California San Francisco, n.d.).

Theme 2: Lifestyle Changes Made Post Diagnosis

Most of the participants understood that they had to make some lifestyle changes and some of them made the changes while others did not. Some reported that they “modified their diets and began to exercise after the diagnosis,” but others stated that “they did not make any changes.” When probed about what changes they made, some reported “changing their diet and starting to exercise,” while others reported that they “improved their diet but did not exercise,” “did not exercise because of heavy lifting on the job,” “increased their physical activity,” “started reading labels,” “or reduced the amount of food” they ate. Some participants reported eating a combination of “carbohydrates, fruits, nuts, and vegetables.” The exercises mentioned were listed “jump rope, gardening, swimming, aerobics, bicycling, lifting weights, walking, going to the gym, line dancing, horseback riding, or climbing stairs” as their various exercise routines. The exercise routines varied from “three times a day to five times per week with duration ranging from 10 minutes on an hour and a half.” P006 stated “I don’t have an exercise routine, but I lift heavy things on my job,”

Diabetes is a lifelong disease that requires behavioral changes enabling patients to perform self-care activities to improve outcomes (Al-Khawaldeh, Al-Hassan, & Froelicher, 2012; Stychar, Elisha, & Schmitz, 2012). The premise of the theory of self-efficacy proposes that what an individual believes about their personal capabilities can predict their behavior (Al-Khawaldeh et al., 2012).

Theme 3: Self-Care After T2D

When probed about their diet, most participants reported that they ate various combinations of fish, fruits, vegetables, carbohydrates, and “sweets.” P008 stated “I do not eat red meat” and P020 said “I eat vegetables and fish only,” and P016 stated “I eat fish, chicken, nuts, and vegetables.” Some reported eating a variety of times per day ranging from “three to six times per day,” and some felt that their eating habits were “appropriate,” others thought that they “could use some improvement,” and a few felt that their diet “was not appropriate.”

Healthy eating is the cornerstone to managing diabetes (Kahleova, Hrachovinova, Hill, & Pelikanova, 2013). Healthy eating entails having a well-balanced meal every time one eats (Clark, 2011). To balance meals, individuals diagnosed with diabetes must plan each meal to include the correct mix of starches, fruits and vegetables, proteins, and fats (Clark, 2011). Kirchbaum, Aarestad, and Beuthe (2003) stated that poor use of carbohydrates leads to hyperglycemia and numerous incidences of morbidity and mortality relating to T2D.

Some participants reported that they do some type of exercise. The exercises mentioned were listed “jump rope, gardening, swimming, aerobics, bicycling, lifting weights, walking, going to the gym, line dancing, horseback riding, or climbing stairs” as their various exercise routines. The exercise routines varied from “three times a day to five times per week” with duration ranging from “10 minutes” to “an hour and a half.”

When probed about why they chose their present exercise routine, responses included convenience, because they liked it, and the doctor’s recommendation. When queried about why they choose a particular type of exercise, the responses revealed “lowering blood sugar, a prior injury, because a previous exercise program did not work, cost, and convenience.” P013 reported going to the gym “because walking did not work.”

Exercise is critical in managing T2D and is labeled as the cornerstone in treating T2D (Barengo, & Tuomilehto, 2012). Exercise can reduce blood sugar levels for patients living with T2D by helping to reduce the amount of insulin in the blood (Leontis, n.d.). Recognizing the appropriate ways to address the day-to-day decisions is significant for controlling diabetes (Shigaki et al., 2010). To self-manage diabetes effectively, patients must initiate and maintain activities that relate to diet, exercise, using medication, and performing daily activities (Shigaki et al., 2010; Strychar, Elisha, & Schmitz, 2012).

The participants understood that they must take care of their mouth, teeth, and gums, and some of the participants reported that they brushed and flossed their teeth, others reported others reported only brushing their teeth. Some of the other answers were “using mouthwash in addition to brushing and flossing, while others reported that they wear dentures and do not floss.” P 020 reported “brushing, flossing, and using plackers,” and P009 stated “I only brush my teeth.” Most of the participants reported visiting their dentist “every 6 months,” but others reported “visiting every 4 months” or “not visiting” at all. P009 said “I don’t visit a dentist.”

Diabetes is a disease that can affect dental health (Leite, Marlow, & Fernandez, 2013). Oral complications can be devastating to patients with T2D and can cause gingivitis, tooth caries, periodontitis, and taste impairment (Leite, et al., 2013). Studies have shown that several patients diagnosed with T2D were deficient in general oral health (Leite et al., 2013). Few of these patients visited the dentist for regular checkups, and many patients were unaware of the effects that oral health had on T2D (Leite et al., 2013).

When questioned about foot care, the most frequent response was “washing and drying between the toes, having pedicures, soaking, scrubbing and inspecting their feet.” When asked whether they had their feet checked some participants some reported having their feet checked by a specialist, such as a podiatrist 4 to 6 month, every three months, and one participant yearly, while the others did not go to a podiatrist or get their feet checked. P002 stated “I get pedicures and wear comfortable shoes.” P018 stated “I have to get one” (a podiatrist). P014 said “the doctor clips my nails and I put lotion on my feet.” None of the participants mentioned wearing foot wear at home and some participants were wearing thong slippers.

Foot care involves washing, drying, and lubricating the feet to prevent the accumulation of humidity between the toes. Wearing thong slippers doubles the risk of lower extremity amputations in people living with diabetes (Hennis, Fraser, Jonnalagadda, Fuller, & Chaturvedi, 2004).

The last guiding question asked what effect health literacy has on how the patients manage the disease. Half of the participants who had increased HbA1c also had low health literacy skills and some of those with low health literacy scores reported having difficulty understanding information presented to them by their health care provider. Based on the above findings, health literacy might play an integral role in how patients living with T2D understand and manage the disease.

Theme 4: Support Systems

When probed about who helps them manage the disease most patients reported family members including “spouses, friends, and children” assisted them with managing the disease. When asked about the information their provider gave about self-managing the disease, all participants responded that they received adequate information. All participants said they felt comfortable seeking information from their treating physician. The strategy for building health literacy skills is an interrelated system that consists of emotional support, behavioral approach, and an instructional approach (Dunn, Margaritas, & Anderson, 2017).

There is no literature to support that there is a problem with health literacy and diabetes in Barbados; however, with the outcomes for diabetes in Barbados less than optimal (Adams

& Carter, 2011), there could be a problem with health literacy as it relates to diabetes self-management. With several people of over age 40 having T2D (Taylor et al., 2014), and the people living with T2D in Barbados needing better care, as evidenced by the high prevalence of preventable diabetes problems, Taylor et al. (2014) suggested that patient education is imperative.

Discussion

Four themes (understanding T2D, changes made post diagnosis, self-care after while living with T2D, and support system) emerged from the study, and they represented commonalities among the 20 participants. The themes emerged from the participants' responses to the 13 semi-structured open-ended interview questions. The participants indicated that they understood how to manage T2D and understood the information that their doctor provided.

The conclusions drawn from the themes are summarized to show how the implications of the findings enable reflection on the study and research process. The reflection includes an assessment of what influences the findings might have on society. The identified themes provided similarities with the conceptual frameworks behind the study. The Health Literacy Framework focused on defining the scope of the problem of health literacy, identifying obstacles to creating a health literate public, approaches used to increase health literacy worldwide, identifying goals, and suggesting approaches to overcome obstacles. Most of the participants in the study showed moderate to high health literacy skills and reported that they understood the information provided by their treating physician.

The Zarcadoolas, Pleasant, and Greer framework (Zarcadoolas et al., 2005) focused on the ability of patients to use skills learned over their lifetime to search for, evaluate, and use information to improve health outcomes and the quality of life. In the current study, some of the participants' responses to the interview questions indicated that they had the necessary skills to manage T2D.

Orem's self-care and Bandura's self-efficacy theory provided the basis for the theory of diabetes self-management. The self-care and self-efficacy theories relate to how individuals engage in self-care and the confidence in their ability to perform self-care (Sousa & Zauszniewski, 2006). To provide productive self-care operations, patients must understand the disease, as well as how to perform measures of care to meet self-care requisites, and how to use appropriate means to achieve regular human function (Orem, 1985).

Recommendations

Presenting information to patients is very important in managing T2D. To present information to patients successfully, providers should speak in terms that are easy to understand, make sure that the patients understand what they are saying, and use plain and clear communication. Several methods including the teach back method could be used to ensure understanding of the disease and its complications and health care providers should be more aware of what the patients understand about the disease and how to manage it effectively.

Some other ways to present the information appropriately are to (a) avoid using jargon, (b) speak clearly, (c) give information in small amounts, (d) use the teach-back method, and (e) check the patients' understanding after the consultation (Protheroe & Rowlands, 2013). Healthcare leaders, policymakers, and healthcare providers must understand the concept of health literacy. "Understanding the concept of health literacy, clarifying its meaning, and developing strategies to assess and evaluate a person's health literacy levels are key factors in...providing holistic health care" (Eadie, 2014, p. 12).

Healthcare leaders, policymakers, and healthcare providers in Barbados should become aware of the role that health literacy might play in how patients in Barbados manage T2D and tailor the information they provide to meet the patients' health literacy needs. To develop effective patient education and increase T2D control in patients, healthcare providers in Barbados must use strategies that will consider patients' health literacy levels and self-care skills (Tang, Pang, Chan, Yeung, & Yeung, 2008). The above strategies could improve the way patients in Barbados living with T2D manage the disease and improve health outcomes.

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